# Loads and Dynamics Harmonization Working Group

## Disposition of Comments

**Date:** 5/19/00

**Document:** Proposed Advisory Circular 25.491-1, "Taxi, Takeoff and Landing Roll Design Loads"

**Published:** Federal Register Volume 64, No 199, dated October 15, 1999

**Date comment period closed:** December 14, 1999

**General assessment of comments:**

Several comments were received from 2 commenters (Transport Canada and the General Aviation Manufacturers Association). Because of the substantive nature of some of the comments, the FAA requested the ARAC Loads and Dynamics Working Group by letter dated February 8, 2000 to consider the comments and provide recommendations for the disposition of the comments along with any recommendations for changes to the Advisory Circular. Comments are summarized as follows along with recommended disposition.

**1) Altitude temperature effects should be taken into account**

The commenter was concerned with the effect of altitude and temperature on the $V_{L2}$ speed used in the Advisory Circular. The working group disagreed that this was necessary for $V_{L2}$ since altitude and temperature are a part of the $V_{L2}$ definition in section 25.479. However, it was recognized that the Advisory Circular also references the speed $V_R$ and there is no such definition for the speed in the FAR. Therefore, the HWG recommends that the words (..defined at maximum altitude and temperature) be inserted after $V_R$ in the Advisory Circular. (See attached draft)

**2) The Ground Vibration test and Landing Gear drop tests should be referenced.**

The commenter suggested that the Ground Vibration tests and Landing Gear shock absorption tests be referenced in regard to the mathematical model used for the taxi load analysis and further, that the maximum structural damping levels should be prescribed. The HWG agreed that the ground vibration tests should be referenced as an acceptable validation means for the airframe dynamic model but the group disagree that the Advisory Circular should set a specific upper limit on the damping values that are allowed to be used in the analysis different values could be appropriate if justified by test experience. (See attached draft)

**3) Provide guidelines for the speed increment to be used.**

The commenter suggested that the Advisory Circular provide guidelines for speed increments to be used for the "constant speed runs" prescribed by the advisory circular.

The basic objective is that the constant speed run that produces the peak loads should be searched for, and this can only be done by using a sufficiently small increment of speed. Rather than prescribe a specific speed increment, that may no fit all airplane models, it was agreed that this basic objective be explicitly stated. The HWG agreed that AC text should be modified in this regard along with additional clarification for the reason that the speed runs be "constant" instead of accelerated. (See attached draft)

**4) Light weight conditions should also be investigated.**

The commenter was concerned that lighter weights can produce higher load factors. While the HWG understand that higher load factors can result from lighter weights, these conditions will not result in critical design loads for the aircraft as other design conditions such as for gust and landing impact will provide higher loads. The HWG believes that adding additional weight conditions would result in additional analysis with no added value. No change in the weight conditions is proposed.

**5) AC should differentiate between trimable and untrimable stabilizers.**

The commenter was pointing out that paragraph 4d of the AC uses language that is applicable to only one kind of stabilizer. The HWG agree and it was agreed to change the second sentence by removing "set within the appropriate green band" with "at the appropriate". Also the text "relative to the stabilizer" would be added after the word "faired" in the last sentence of this paragraph. (See attached draft)

**6) Combined load condition in paragraph 6 should be better defined.**

The commenter was concerned that there needed to be a more precise definition for the combined load condition prescribed by paragraph 6. The commenter provided some suggestions for combinations to consider. The HWG agreed with the commenter that a better definition was needed. The HWG proposes to add the following text into paragraph 6. "drag load of 20% of the vertical load and a side load of 20% of the vertical load. Side load acting in either direction should be considered." (See attached draft)

**Conclusion:**

The HWG has addressed all the public comments and proposes changes as marked in the attached draft.

**Revised Advisory Circular Attached.**